

Use on paving projects that contain HMA or concrete pavement bid items where the posted speed limit is 45 mph or greater. Do not include on projects that have less than one mile of associated paving work. Use a pre-established unit price of \$1 in the schedule of items and a quantity based on \$2000 per lane mile of pavement covered under the specification.

440-010

## **QMP Ride; Incentive IRI Ride, Item 440.4410.S.**

### **A Description**

- (1) This special provision describes profiling pavements with a non-contact profiler, locating bumps, and determining the International Roughness Index (IRI) for each wheel path segment.

### **B (Vacant)**

### **C Construction**

#### **C.1 General**

- (1) In addition to engineer-directed straightedging as specified in standard spec 450.3.2.9 for HMA pavements, standard spec 415.3.11.8.1 for concrete pavement, and standard spec 502.3.7.8 for bridges, profile the final riding surface of all mainline pavements, bridges, and bridge approaches with a posted speed limit of 45 miles per hour (72.4 km/h) or greater.
- (2) Unless the engineer and contractor mutually agree otherwise, arrange to have a calibrated profiler available to project staff when paving the final riding surface. Notify the engineer before calibrating the profiler. If the engineer requests, arrange to have the engineer observe the profiler calibration and operation.
- (3) Have a profiler operator, certified under the department's highway technician certification program (HTCP), operate the equipment, collect the required data, and document the results using the methods taught in the HTCP profiling course.

#### **C.2 Equipment**

- (1) Furnish a profile measuring device capable of measuring IRI from the list of department-approved devices published on the department's web site:  
<http://roadwaystandards.dot.wi.gov/standards/qmp/index.htm>

#### **C.3 Testing**

##### **C.3.1 Run and Reduction Parameters**

- (1) Before starting data collection, enter the appropriate pavement stationing information and the following reduction parameters:

Reduction length .....	500 feet (152.4 m)
Bump height.....	0.40 inches (10mm)
Bump length.....	25 feet (7.6m)
Dip locator .....	off
Bump locator.....	on
- (2) Also enter the additional equipment-specific department-approved filter settings and parameters listed on the department's ride web site.

### C.3.2 Contractor Testing

- (1) Operate profilers within the manufacturer's recommended speed tolerances. Perform all profile runs in the direction of travel. Measure the longitudinal profile of each wheel track of each lane. The wheel tracks are 6 feet (1.83 m) apart and centered in the traveled way of the lane.
- (2) Coordinate with the engineer to schedule profile runs for acceptance just before opening to public traffic, but early enough to avoid delaying that opening. The department may require earlier testing to accommodate staged construction or if corrective action may be required.
- (3) Measure the profiles of each standard or partial segment. Lay out primary segments starting at a project terminus and running contiguously along the mainline to the other project terminus. For ease of layout, begin the first standard segment length at the first even station of the project. Align segment limits with the subplot limits used for testing under the QMP Concrete Pavement specification. Where a contiguous run over the entire project length is not possible, define the longest possible contiguous runs. Define the longest possible contiguous runs for all applicable pavement. Define segments one wheel path wide and distinguished by length as follows:
  1. Standard segments are 500 feet (152.4 m) long.
  2. Partial segments are less than 500 feet (152.4 m) long.
- (4) Treat partial segments as independent segments.
- (5) The department will categorize each standard or partial segment as follows:
  - Category I: Multiple opportunities to achieve a smooth ride on mainline pavement.
    - Multiple layer mainline HMA pavements.
  - Category II: Single opportunity to achieve a smooth ride on mainline paving.
    - Single layer mainline HMA pavement.
    - Mainline concrete pavement including all gaps.
  - Category III: Limited to the following:
    - Segments containing any portion of a bridge, bridge approach, or railroad crossing.
    - Segments containing any portion of an intersection, defined as the area within the points of curvature of the intersection radii.

### C.3.3 Department Testing

- (1) The department may periodically conduct independent tests to validate the contractor's results. The department and contractor will jointly investigate any discrepancies as soon as it is practical. The investigation may include additional testing, inspecting and calibrating equipment, and reviewing testing procedures of both parties. Both the department and the contractor will document all work performed in resolving a discrepancy.

### C.3.4 Documenting Profile Runs

- (1) Calculate the IRI for each segment. Within one business day after completing a final profile run, unless the engineer and contractor mutually agree otherwise, submit a computer printed profile trace for each segment showing pavement stationing, IRI, and bump locations. The print-out must also indicate the run and reduction parameter settings, specified in C.3.1, used for each run and clearly document that equipment settings and parameters used for each run are consistent with the settings listed on the department's web site:

<http://roadwaystandards.dot.wi.gov/standards/qmp/index.htm>

- (2) Also locate individual features including construction joints, structure limits, design features, and other features that might affect the department's evaluation of ride quality. Tie this information to specific locations on the profile traces. Submit this information with the profile trace printouts either on printed reports that might be available as profiler software output or in supporting documentation such as diaries or logs maintained independently by the profiler operator.
- (3) Within 5 business days after completing profiling of the pavement covered under this special provision, unless the engineer and contractor mutually agree to a different timeline, submit electronic .ERD files for each profiler run on a CD and submit profile data using the department's Materials Reporting System (MRS) software. Qualified personnel may obtain the MRS software from the department's web site at:

<http://www.atwoodsystems.com/mrs>

## **C.4 Corrective Actions**

### **C.4.1 General**

- (1) Correct the ride as the engineer directs. The department will independently assess whether a repair will help or hurt the long-term pavement performance and/or public perception of the ride before deciding on corrective action.

### **C.4.2 Corrective Actions for Bumps**

- (1) The engineer will review each individual wheel track for bumps; high points deviating more than 0.4 inches (10 mm) in 25 feet (7.6 m). The engineer will assess bumps individually and do one of the following for each bump:
  1. Direct the contractor to correct the bump to minimize the effect on the ride.
  2. Assess a price reduction of \$500 for each bump in each wheel path.
  3. Leave the bump in place with no price reduction.
- (2) The engineer will not direct corrective action or assess a pay adjustment for a bump without independent identification of that bump as determined by physically riding the pavement. For bump removal on HMA pavements, use only techniques the engineer approves. For bump removal on concrete pavement, use diamond grinding as the engineer directs.
- (3) Reprofile corrected bumps to verify that the high point deviation is less than 0.3 inches (8 mm) in 25 feet (7.6 m) after correction.

### **C.4.3 Corrective Actions for Excessive IRI**

- (1) If an individual segment IRI exceeds 140 in/mile (2210 mm/km) for category I or exceeds 140 in/mile (2210 mm/km) for category II pavement after bump correction, the engineer may require the contractor to correct that segment. Correct the segment final surface as follows:

Category I: Correct to an IRI of 55 in/mile (868 mm/km) using whichever of the following methods the engineer directs:

- Remove and replace the full lane width of the riding surface excluding the paved shoulder.
- Overlay the full lane width of the surface layer including the paved shoulder.

HMA Category II: Correct to an IRI of 105 in/mile (1657 mm/km) using the following method if the engineer directs:

- Remove and replace the full lane width of the riding surface excluding the paved shoulder.

Concrete Category II: Correct to an IRI of 105 in/mile (1657 mm/km) using whichever of the following methods the engineer directs:

- Continuous diamond grind the full lane width of the riding surface including adjustment of the paved shoulders.
- Remove and replace the full lane width of the riding surface.

- (2) Reprofile corrected segments to verify that the final IRI meets the above correction limits and there are no bumps. Segments failing these criteria after correction are subject to the engineer's right to adjust pay for non-conforming work under standard specifications 105.3.

### **D Measurement**

- (1) The department will measure Incentive IRI Ride by the dollar, adjusted as specified in E.2.

### **E Payment**

#### **E.1 Payment for Profiling**

- (1) Costs for furnishing and operating the profiler; documenting profile results; and correcting the final pavement surface are incidental to the contract.

#### **E.2 Pay Adjustment**

- (1) The department will pay incentive for ride under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
440.4410.S	Incentive IRI Ride	DOL

- (2) Incentive payment is not limited, either up or down, to the amount the schedule of items shows.
- (3) The department will administer disincentives for ride under the Disincentive IRI Ride administrative item.

- (4) The department will adjust pay for each segment based on the initial IRI for that segment before any corrective action is taken. The department will base disincentives on the IRI after correction for pavement meeting the following conditions:

<u>For All Pavements:</u>	The corrective work is performed in a contiguous, full lane width section 500 feet (152.4 m) long or longer.
<u>For HMA Pavements:</u>	The corrective work is a mill and inlay or full depth replacement and the inlay or replacement layer thickness conforms to standard spec 460.3.2.
<u>For Concrete Pavements:</u>	The corrective work is a full depth replacement and conforms to standard spec 415.

- (5) The department will adjust pay for 500-foot (152.4 m) long standard segments nominally one wheel path wide as follows:

For Category I segments:

INITIAL IRI (inches/mile)	PAY ADJUSTMENT <sup>[1]</sup> (dollars per standard segment)
0 to <25	250
≥ 25 to <35	875 - (25 x IRI)
≥ 35 to <55	0
≥ 55 to <120	5500/13 - (100/13 x IRI)
≥ 120	- 500

For Category II segments:

INITIAL IRI (inches/mile)	PAY ADJUSTMENT <sup>[1]</sup> (dollars per standard segment)
0 to <50	250
≥ 50 to <65	3250/3 - (50/3 x IRI)
≥ 65 to <105	0
≥ 105 to <120	3500 - (100/3 x IRI)
≥ 120	- 500

For Category III segments:

INITIAL IRI (inches/mile)	PAY ADJUSTMENT (dollars per standard segment)
0 to <50	250
≥ 50 to <65	3250/3 - (50/3 x IRI)
≥ 65	0

<sup>[1]</sup> If the engineer directs placing upper layer asphaltic mixtures between October 15 and May 1 for department convenience as specified in standard spec 450.3.2.2(5), the department will not assess disincentive on pavement the department orders the contractor to place when the temperature, as defined in standard spec 450.3.2.1(2), is less than 36 F (2 C).

- (6) The department will prorate the pay adjustment for partial segments based on their length.

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